

Technical fact sheet

Cotton blue disease

What is it?

Cotton blue disease (CBD) is suspected to be caused by aphid-transmitted viruses. Although the disease has been reported from Africa, Asia and the Americas, a causal agent has only been identified from Brazil (Cotton leafroll dwarf virus; CLRDV).

Although CLRDV is the causal agent of blue disease in Brazil, it is not known if this is the causal agent in other regions. Furthermore, CBD has similarities with other diseases of cotton, such as cotton bunchy top, anthocyanosis and cotton leaf roll. It is not known if the same pathogen causes all these diseases or if there are multiple pathogens causing similar symptoms. However, CLRDV was not detected from Australian cotton plants affected by bunchy top disease. A common feature of all of these diseases is that they are spread by the cotton aphid, *Aphis gossypii*.

What do the symptoms look like?

CBD affected leaves tend to be small, thick, more brittle and leathery than healthy leaves and have an intense green to bluish colour with yellow veins. Reddening of stem petioles and leaf veins can occur in some infections. Leaf edges tend to roll downwards, plants become stunted due to a shortening of the branch internodes and they produce many branches, giving a bunchy zig-zag stem habit. Symptoms are more obvious in plants infected at an early age. Infected plants also produce smaller bolls and boll shed may occur.

CBD is often seen as small patches of plants, often just on a single row, with single infected plants occasionally overlooked if overgrown by nearby healthy plants.

The susceptibility of different cotton species and commercial varieties to blue disease varies. Some triploid varieties are resistant to the disease, particularly if *G. arboreum* is used as a parent. The longevity of this resistance is unknown, but evidence suggests it is being lowered.

There are no known hosts of blue disease outside cotton.



Ivan Bonacic, INTA

CLRDV-infected cotton plant with the intense green-blue leaf colour which gives blue disease its name. The plant is also severely stunted and has abnormal growth habit.



Lewis Wilson, CSIRO

Infected cotton plant with downward rolling of leaf edges typical of blue disease. On these leaves the veins appear discoloured with major veins red and the minor yellow in colour.



Compiled by Cherie Gambley

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What can it be confused with?

CBD has similar symptoms to cotton bunchy top disease. Both diseases display shortened internodes and can result in stunted plants. However, the discolouration of leaves varies between the two diseases. The typical green-blue colour and yellow veins observed in CBD-affected leaves is absent from those affected by cotton bunchy top and instead there is an angular pattern of pale green margins and darker green centres with the latter disease.

What should I look for?

CBD can be detected by visual examination of unhealthy looking plants. Plants which are stunted, have downward rolling leaf edges and/or an odd growth habit should be selected for closer evaluation. Other symptoms to look for include:

- Intense green or bluish colour of leaves
- Veins, petioles and stems becoming dark red-purple
- Yellowing of minor veins
- Zig-zag stem habit, shortened internodes and many branches
- Leaves with a brittle and leathery texture
- Flowers and bolls fewer and smaller than normal

How does it spread?

CLRDV is moved between plants by, the cotton aphid (*Aphis gossypii*). The virus is taken up by the aphid during feeding and remains within the insect for anywhere from a few weeks, to the entire life of the insect. Later, the virus is deposited into other plants when the insect feeds again. Disease spread is favoured by conditions which are suitable for aphid reproduction, feeding and spread.

Where is it now?

CBD and other similar leaf roll diseases are known to occur in Benin, Chad, Cameroon, Ivory Coast and Zaire as well as in Brazil, Argentina and Paraguay. Similar symptoms have also been described from Azerbaijan, Turkmenistan and Armenia as well as from the Philippines and Thailand.

How can I protect my farm from Cotton blue disease?

Check your farm frequently for the presence of new pests and unusual symptoms. Make sure you are familiar with common cotton pests so you can tell if you see something different.

If you see anything unusual, call the Exotic Plant Pest Hotline on 1800 084 881.



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